Claims

1. A system for the production, storage and dispensation of hydrogen, said system comprising:
   (a) at least a sealed and replaceable cylinder filled with water having a lid, mounted vertically on a platform,
   (b) a rotatable and replaceable container to store encapsulated metal hydride shells, said container is fixed to the inner surface of the cylinder, on both the sides, by supporting rings with rollers to provide a rotatable support,
   (c) a lid having a moist separation mesh serving as a passage for the hydrogen flow, fixed on top of the cylinder as inlet means for encapsulated metal hydride shells and water before said cylinder is sealed and mounted on the platform,
   (d) a slider base member disposed at the bottom end of the cylinder said slider is fixed to the inner surface of the cylinder, on both the sides, by supporting rings,
   (e) said slider base member acts as a bottom to the container, said slider base having a passage, said passage in flow communication with a slider path to transmit the encapsulated metal hydride shells from the container into the cylinder,
   (f) a plurality of baffles disposed both inside and outside periphery of said rotatable container, said inner baffles adapted to regulate and direct the flow of the encapsulated metal hydride shells of the container on to the slider path through said passage of the slider base and said outer baffles adapted to rotate the container,
   (g) a pair of movable ramming means extending plane perpendicular to the pair of containers disposed at the bottom end of the slider path, said ramming means including a disintegrating site to receive the encapsulated metal hydride from the slider and a movable piston for the disintegration and dispersion of broken shells and metal hydride into the cylinder,
   (h) a motion transmitting element mounted on the ramming means connected to outer baffles to provide a corresponding rotatable action to the container;
   (i) an outlet disposed on the lid of the cylinder to release the hydrogen thus produced in the cylinder, and
   (j) a control panel to control the operations of the system.
2. The system as claimed in claim 1, wherein said cylinder consisting of a valve at

the bottom end to control the flow of the water, disintegrated shells along with by-products.

3. The system as claimed in claim 1, wherein the lid of the cylinder is an elevated hollow lid disposed on top of the cylinder consisting of hydrogen outlet and rupture diaphragms.
4. The system as claimed in claim 1, wherein optionally a plurality of cylinders and containers is connected in series for hydrogen production, storage and dispensation.
5. The system as claimed in claim 1, wherein said container is made of material selected from mild steel and stainless steel.
6. The system as claimed in claim 1, wherein the ramming means consisting of a movable piston and a cavity at the end to facilitate the disintegration of encapsulated shells.
7. The system as claimed in claim 7, wherein the metal content for metal hydride is selected from Sodium, Boron, Lithium, Potassium and magnesium with aluminum or any metal hydride capable of releasing hydrogen
8. The system as claimed in claim 7, wherein the encapsulated metal hydride shells having shapes selected from spherical, cylindrical, rectangular and square, preferably spherical.
9. The system as claimed in claim 1, wherein the encapsulation of metal hydrides is done using the polymeric material selected from polystyrene, poly methyl methacrylate (PMMA), PVC with less plasticizer, HDPE, brittle poly olefins, preferably polystyrene and PMMA.
10. The system as claimed in claim 1, said hydraulic power means consisting of a hydraulic pack and the hydraulic cylinders with suitable sealing mechanism to prevent leakage during reciprocating motion of the piston while disintegrating the encapsulated metal hydride shells.
11. The system as claimed in claim 1, said system is designed to enable the swapping of empty containers with filled containers with ease preventing the exposure to the chemicals.
12. The system as claimed in claim 1, wherein the control panel is controlled by devices selected from analogue and digital devices.
13. The system as claimed in claim 1, wherein the bottom outlet of the container

consisting of an outlet valve is sealed and opened only during refilling, to prevent accidental spillage.

14. The system as claimed in claim 1, wherein baffles are used to provide an uninterrupted and selected flow of encapsulated metal hydride materials to the disintegration site.

15. The system as claimed in claim 1, wherein the ramming means crushes the metal hydride shells into small and tiny debris that are collected at the bottom of the container for easy disposal and recycling.

16. The system as claimed in claim 1, the accumulation of disintegrated pieces of encapsulated metal shells facilitates in creating a space in the container itself for storing and dispensing of hydrogen.

17. The system as claimed in claim 1, wherein the ramming means can be directed to crush the encapsulated metal hydride shells in any selected cylinder connected to the system.

18. The system as claimed in claim 1, wherein the intervening gaps among the encapsulated metal hydride shells in the container are utilized as an additional storage means for the hydrogen gas.

19. The system as claimed in claim 1, wherein the hydraulic power means having a hydraulic seal is placed at the bottom of the system not only to prevent the leakage from the system but also to have a multi-container dispensing system.

20. The present invention also provides a method for the production, storage and dispensation of hydrogen by using the system as claimed in claim 1, said method comprising the steps of;

(a) mounting the sealed cylinders on the platform filled with a proportionate quantity of water and a container with encapsulated metal hydrides,

(b) directing the encapsulated metal hydride into the ramming means by means of baffles disposed in the container and crushing the desired quantities of encapsulated metal hydride shells to disintegrate into small pieces;

(c) dispersing the metal hydride into the water;

(d) reacting the metal hydride with water to produce hydrogen;

(e) releasing the hydrogen through outlet means provided at the top of the cone and container; and

(f) collecting the disintegrated pieces and the byproducts at the bottom of the container.

21. The method as claimed in claim 20, wherein the metal content for metal hydride is selected from Sodium, Boron, Lithium, Potassium and magnesium with an addition aluminum powder, or any metal hydride capable of releasing hydrogen, preferably sodium hydride.

22. The method as claimed in claim 20, wherein the plurality of cylinders disposed for simultaneous disintegration of enhanced number of encapsulated metal hydrides for the production of hydrogen gas.

23. The method as claimed in claim 20, wherein the aluminum that is used is powder form is in the range of 5-50% to increase the density of the metal hydride and also to produce more hydrogen per unit volume by reacting with an alkali, preferably sodium.

24. The method as claimed in claim 20, wherein the byproducts consisting of NaOH and alumina.

25. The method as claimed in claim 20, wherein the exothermic reaction condition of the process provides the desired temperature range for the formation alumina.

26. The method as claimed in claim 20, wherein the reaction of metal hydride takes place under controller pressure and temperature.

27. The method as claimed in claim 20, wherein both low and high density encapsulated metal hydride shells can be used for production, storage and dispensation of hydrogen gas.